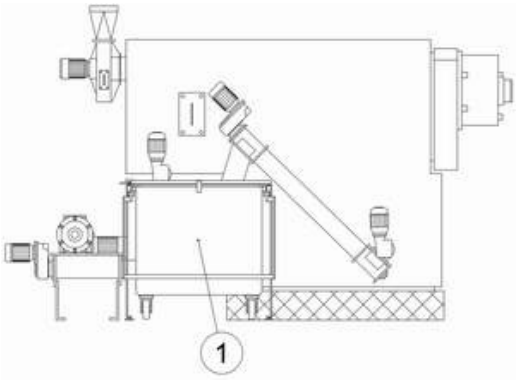
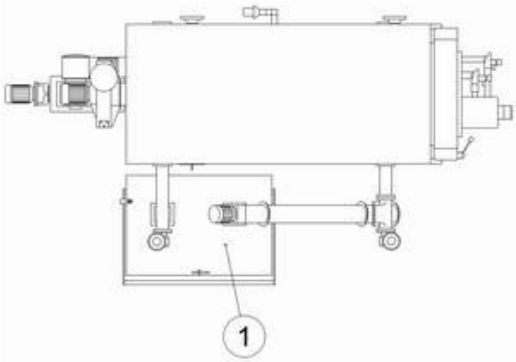
MAINTENANCE Ash container





Maintenance

Ash removal

Placement

On the boiler´s side

Procedure

Check up the ash content in the container, empty it when necessary.

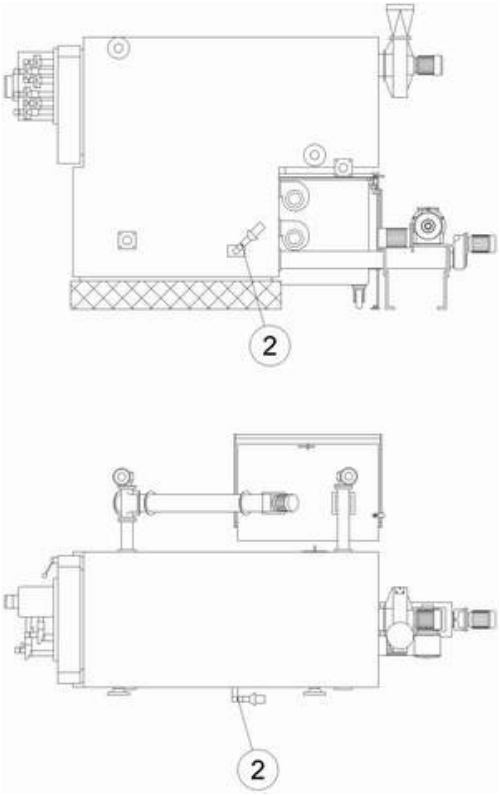
Maitenance period

When necessaryd

Pos. MAINTENANCE-01

GILLES
BIOMASS HEATING

MAINTENANCE Igniter



Maintenance

Igniter

Placement

On the side of heating boiler

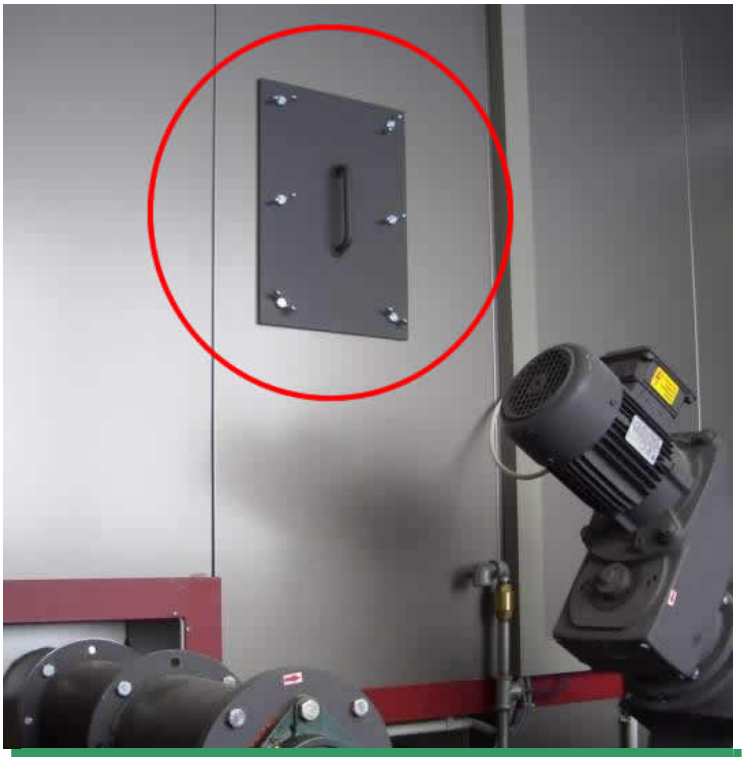
procedure

Unscrew the ignition tube and clean it

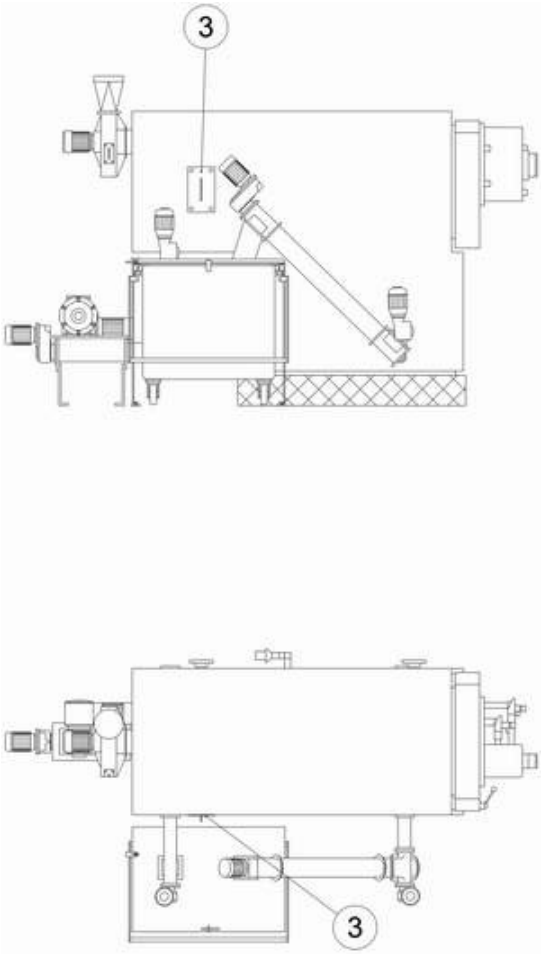
Maintenance period

Half a year

Pos. MAINTENANCE-02



CLEANING Multicyclone



Maintenance

Multicyclone

Placement

Maintenance cover on the side of heating boiler

Procedure

Open the cover plate and clean the multicyclone using industrial vacuum cleaner

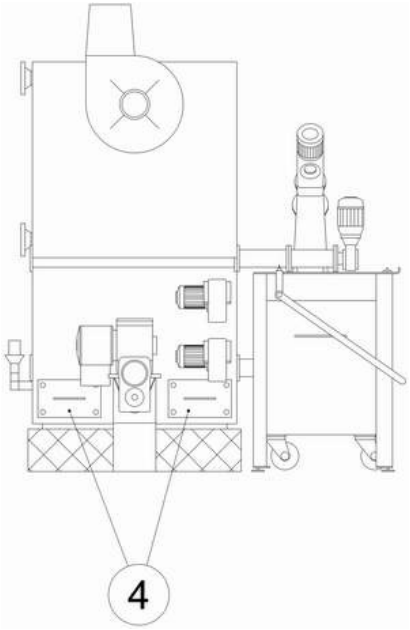
Maintenance period

Quarterly

Pos. MAINTENANCE-03

GILLES
BIOMASS HEATING

MAINTENANCE Ash removal from rost



Maintenance

Ash removal from rost

Placement

On the heating boiler´s back side, near the stocker

Procedure

Open the cover plates, or door and remove the ash from the rost.

Maintenance period

Quarterly

Pos. MAINTENANCE-04

GILLES
BIOMASS HEATING

MAINTENANCE Cleaning of the combustion chamber

Maintenance

Combustion chamber UTSK- under stocker

Placement

‚Front side of the heating boiler

Procedure

1. Cleaning of retort and combustion chamber
2. Cleaning of the surface over the fire bricks

Maintenance period

Quarterly

Pos. MAINTENANCE-05a

GILLES
BIOMASS HEATING

MAINTENANCE Cleaning of combustion chamber

Maintenance

Combustion chamber UTSK- step grate

Placement

‚Front side of the heating boiler

Procedure

3. Cleaning of the combustion surface
4. Cleaning of the surface over the fire bricks

Maintenance period

Quarterly

GILLES
BIOMASS HEATING

Pos. MAINTENANCE-05c

MAINTENANCE Cleaning of burning grate

Maintenance

Burning grate UTSK- understocker

Placement

Front side of the heating boiler

Procedure

1. Remove the ash from the combustion space
2. Cleaning of the burning grate

Maintenance period

Quarterly

Pos. MAINTENANCE-06a

GILLES
BIOMASS HEATING

MAINTENANCE Cleaning of burning grate

Maintenance

Burning grate UTSK-Step grate

Placement

Front side of the heating boiler

Procedure

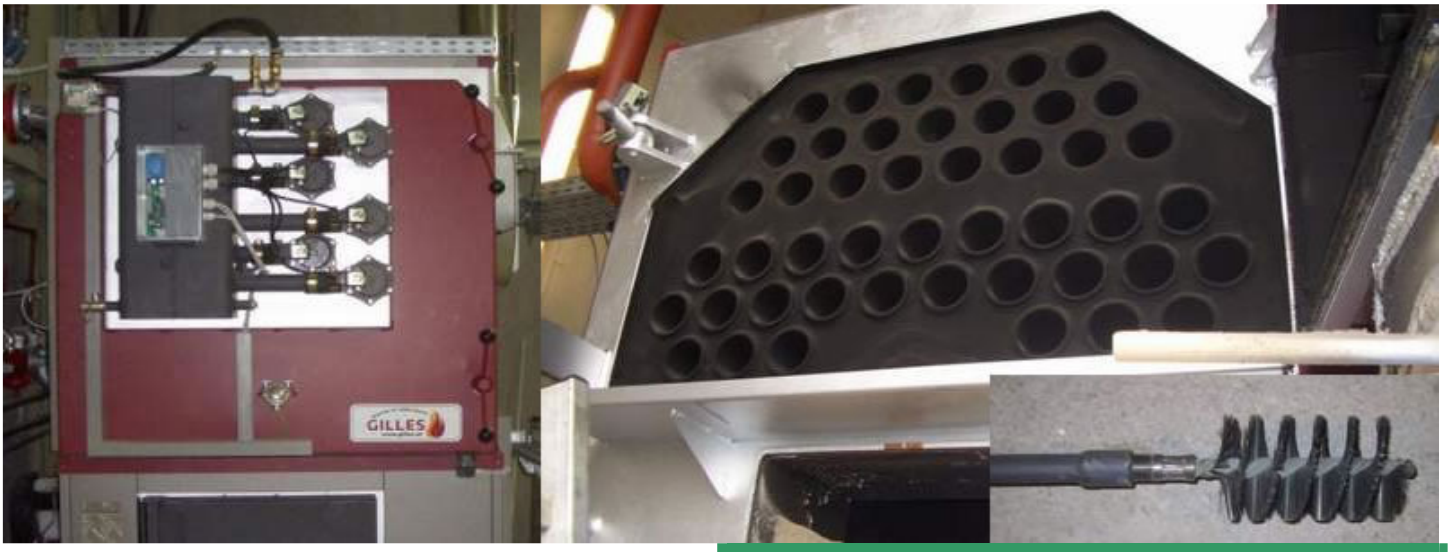
3. Remove the ash from beneath of the step grate
4. Clean the gragesurface and the buring space

Maintenance period

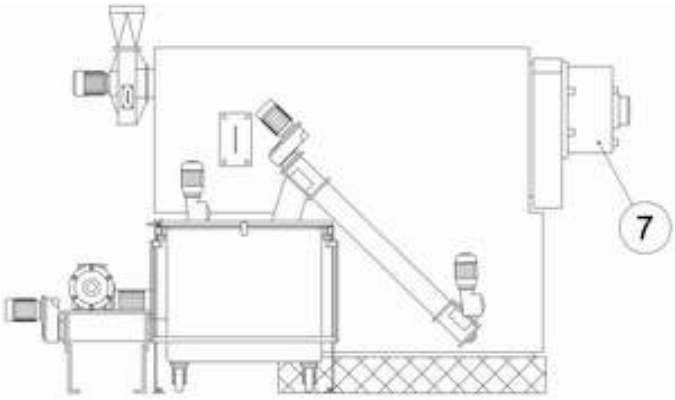
Quarterly

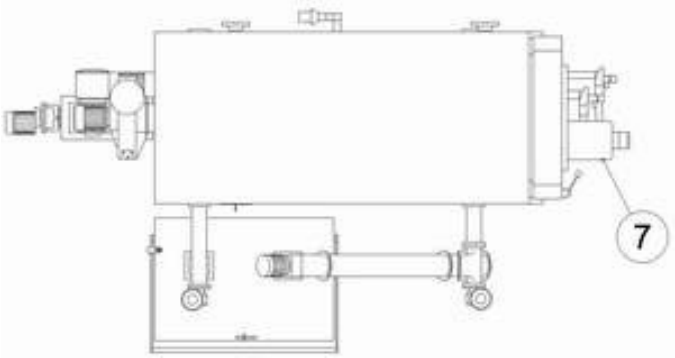
Pos. MAINTENANCE-06c

GILLES
BIOMASS HEATING



MAINTENANCE Cleaing of heat exchanger





Maintenance

Heat exchanger

Placement

Front side of the heating boiler

Procedure

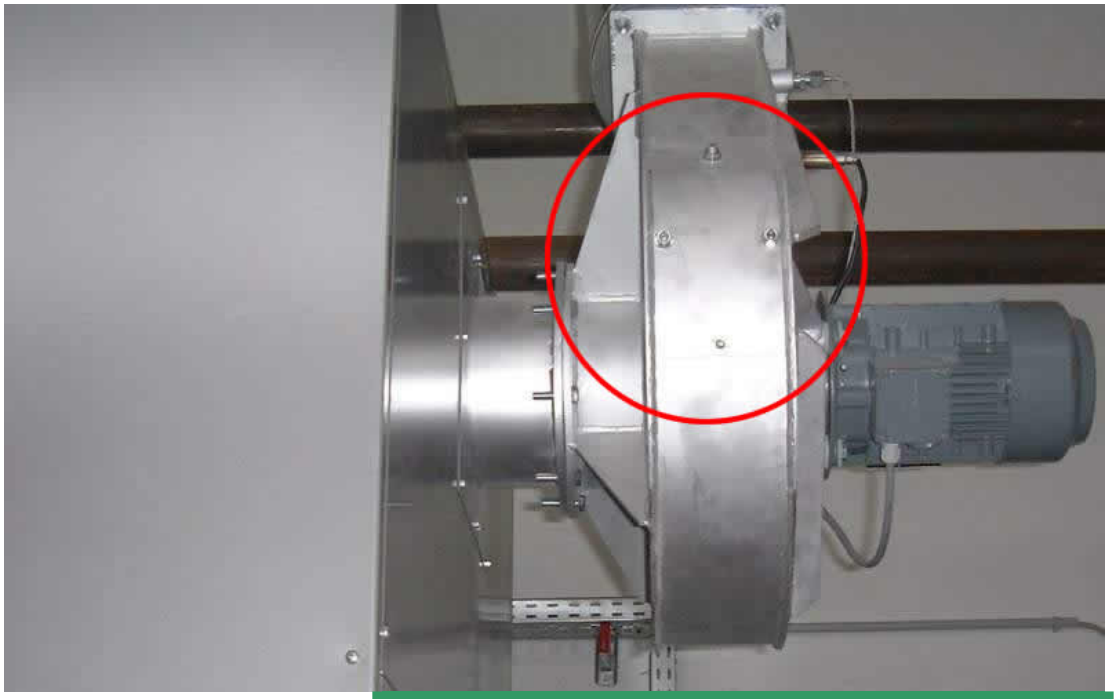
Clean the heat exchanger using the delivered brush.

Maintenance period

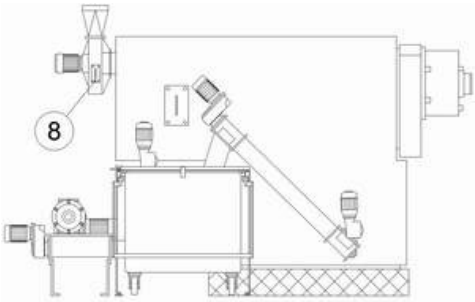
Quarterly

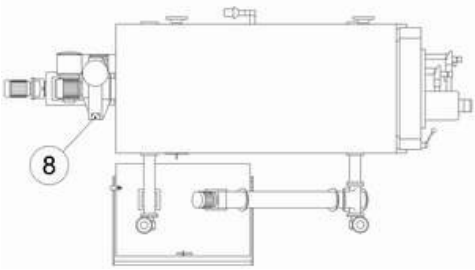
Pos. MAINTENANCE-07

GILLES
BIOMASS HEATING



MAINTENANCE Cleaning of suction blowers





Maintenance

Suction blower

Placement

Back side of the heating boiler

Procedure
Clean the suction blower from ash using an industrial vacuum cleaner.

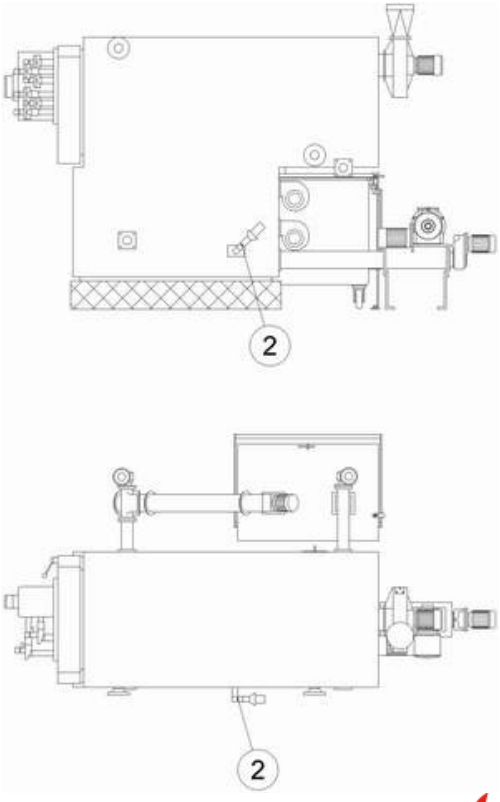
Pay attention to the flue gas sensor, also when cleaning the flue gas pipe.

Maintenance period
Quarterly

GILLES
BIOMASS HEATING

Pos. MAINTENANCE-08

MAINTENANCE Cleaning of flue gas tube



GILLES
BIOMASS HEATING

Maintenance

Flue gas tube and chimney

Placement

Down the suction blower

Procedure

1. Clean and exhaust the flue gas tube
2. Clean the chimney

Maintenance period

Quraterly

Pos. MAINTENANCE-09

CLEANING Compressor

Maintenance

Compressor

Placement

In the heating room near the switch box

Procedure

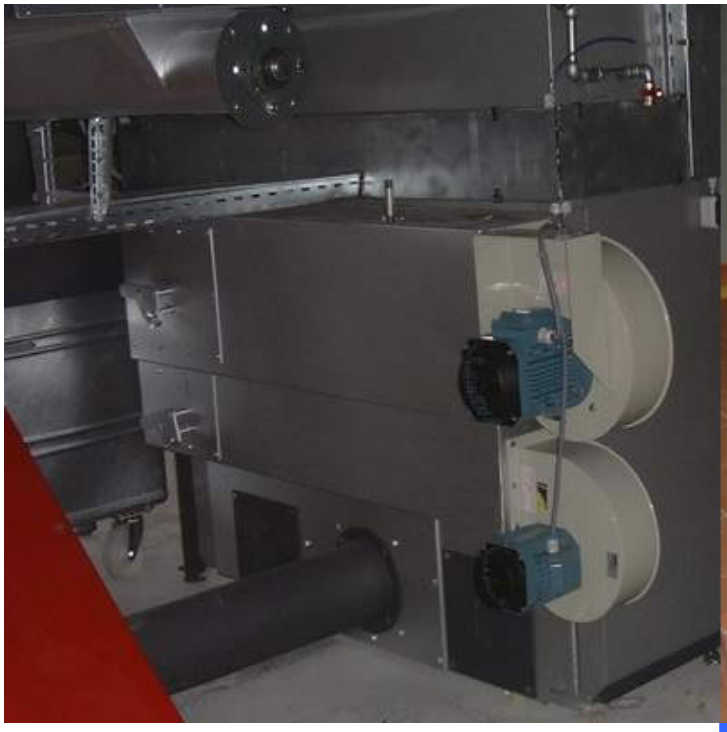
Empty the condensed water vessel on the compressor

Maitenance period

Half a year

Pos. CLEANING-02

GILLES
BIOMASS HEATING



CLEANING

Maintenance

Cleaning

Place

Heating room

Procedure

Cleaning of all motors and blowers

Maintenance period

Half a year

Pos. CLEANING-03

GILLES
BIOMASS HEATING

CLEANING Hydraulic aggregate

Maintenance

Hydraulic aggregate

Placement
In the heating room near the heating boiler

Procedure

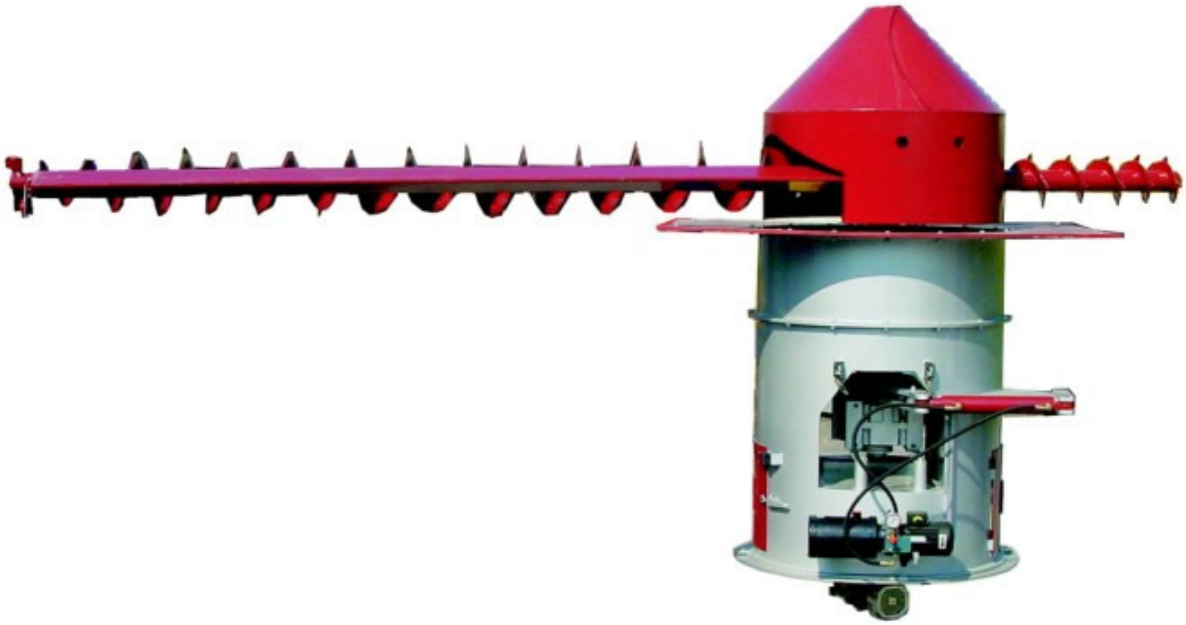
1. Check up the oil level
2. Check up the equipment pressure
3. Check up the operational temperature
4. Check up the sealing of cylinder and hoses

Maintenance period

Once a month

Pos. CLEANING-05

GILLES
BIOMASS HEATING



LUBRICATION Silo discharge

Maintenance

Replacement of gear smear in the silo discharging system

Emptying of silo is necessary

When working in silo, observe the safety rules for works in silo room

The permission for works is imperatively required.

Placement

Beneath the tapered part of silo room

Grease substance

Smear for gears

Amount of grease substance

See the Operation instruction to discharge systems

Maintenance period

Every 2 years

Pos. SILO-01

GILLES BIOMASS HEATING

LUBRICATIONCross feed worm screw

Maitenance

Lubrication of the flange bearings of cross feed worm screw

Placement

Behind the gear motor(on the motor side)

Grease substance

Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

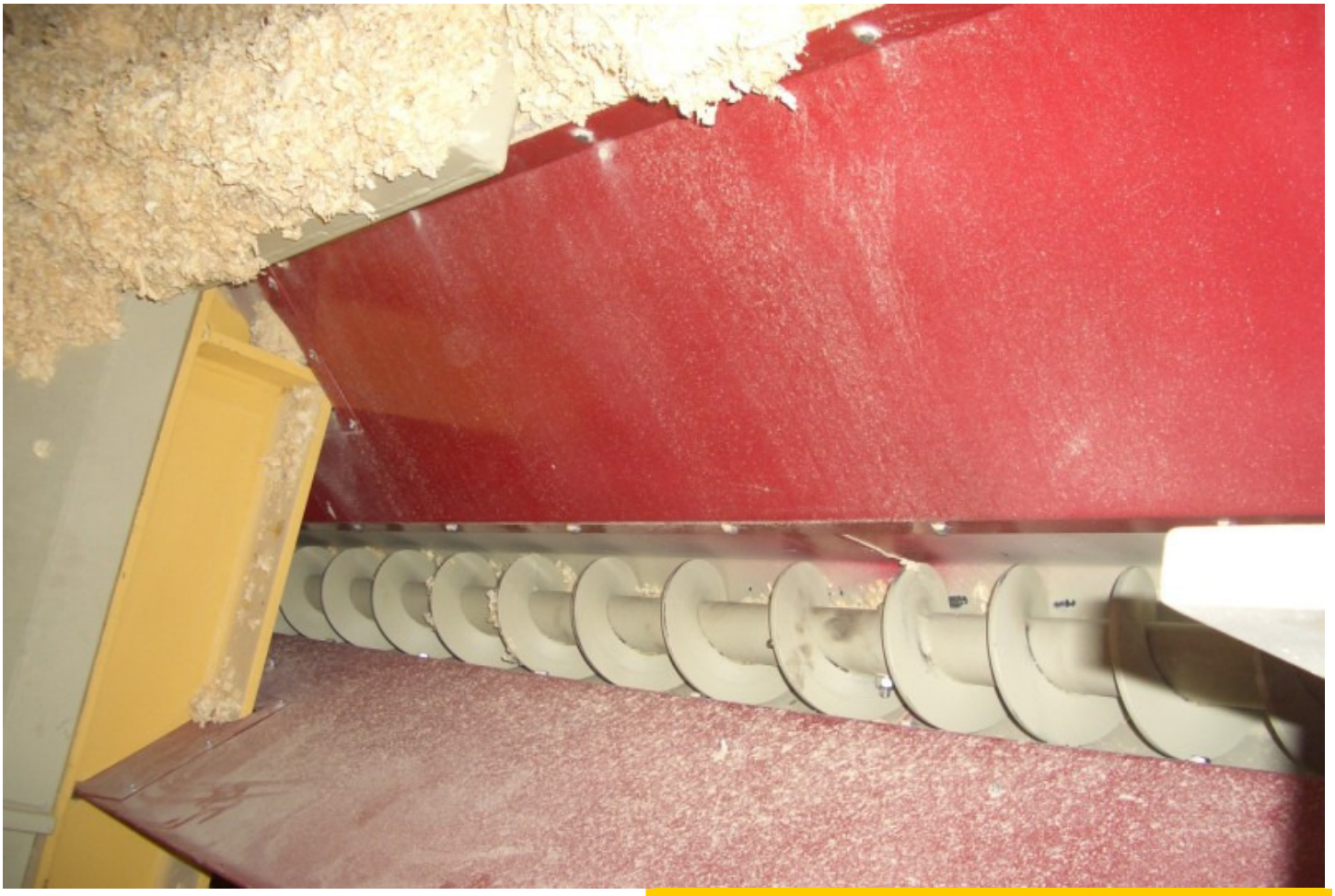
1-2 pump strokes for each greased place

Maintenance period

Quarterly

Pos. PUSH R-01

GILLES
BIOMASS HEATING



LUBRICATION Cross feed worm screw

Maitenance

Lubrication of the flange bearings of cross feed worm screw

Placement

Vis a vis the driving side

Grease substance

Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

1-2 pump strokes for each greased place

Maintenance period

Quarterly

Pos. PUSH-02

GILLES
BIOMASS HEATING

MAINTENANCE Hydraulic push rods

Maintenance hydraulic aggregate

5. Check up of the oil level
6. Check up of the device pressure
7. Check up fo the operational temperature

Place

Hydraulic room

Maintenance period

Once a month

Pos. PUSH-03

GILLES
BIOMASS HEATING

MAITENANCE
Hydraulic push rods

GILLES
BIOMASS HEATING

Maintenance of hydraulic aggregate

Check up of the cylinder and hoses tightness

Placement

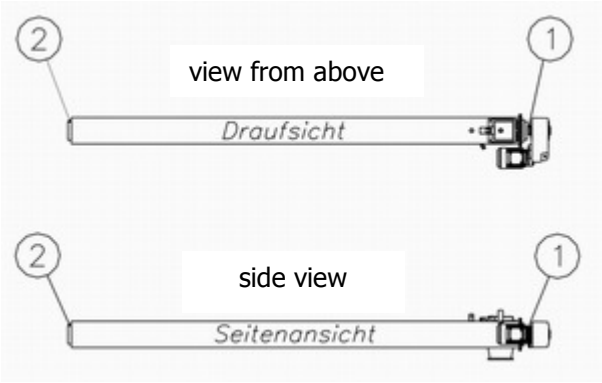
Hydraulic space

Maitenance period

Once a month

Pos. PUSH-04

LUBRICATION PLAN conveyor



Maintenance

Lubrication of the worm screw flange bearing on the side of motor

Placement

Behind the gear motor

Grease substance

Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

1-2 pump strokes for each greased point

Maintenance period

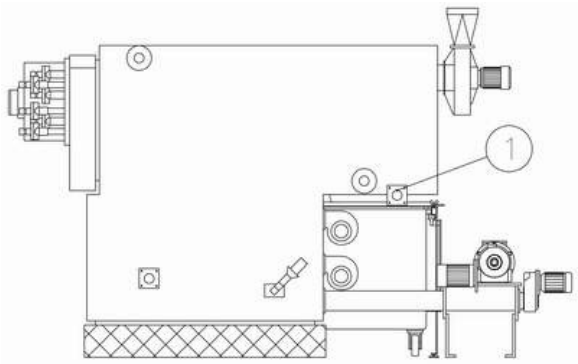
Quarterly

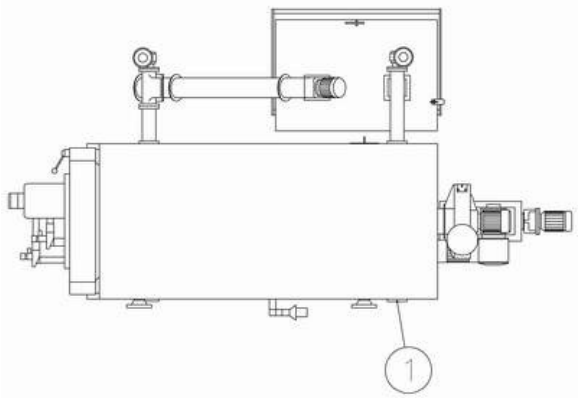
Pos. WORM SCREW-01

GILLES
BIOMASS HEATING

LUBRICATION
Ash worm conveyor

Multicyclone





Maintenance

Lubrication of bearings on the ash worm conveyor on multicyclone

Placement

Vis a vis the driving side

Grease substance

Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

1-2 pump strokes for each greased place

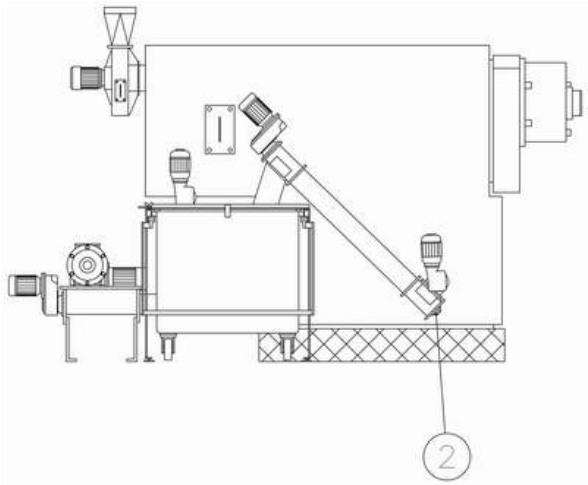
Maintenance period

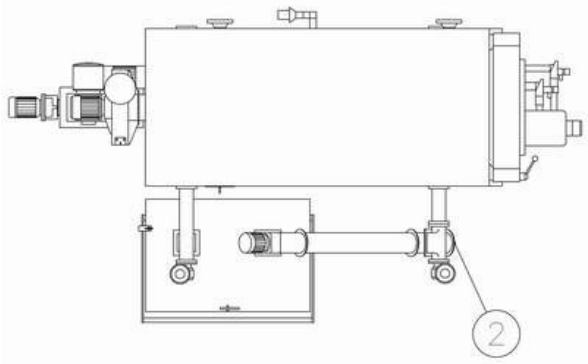
Quarterly

Pos. LUBRIC-01

GILLES
BIOMASS HEATING

LUBRICATION
Ash conveying rising worm screw





Maintenance

Lubrication of rising worm screw bearing

Maintenance

Lubrication of bearing on the ash worm conveyor on multicyclone

Placement

Vis a vis the driving side

Grease substance

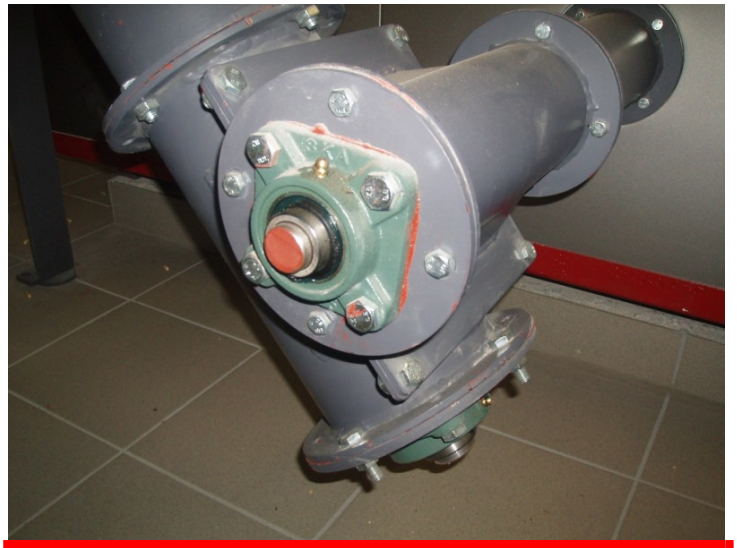
Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

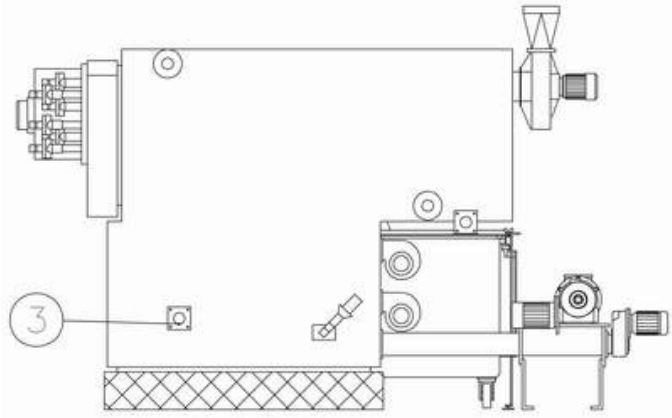
1-2 pump strokes for each greased place

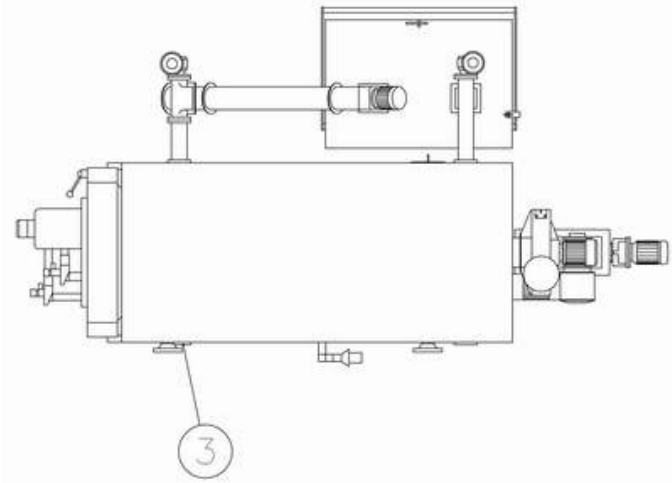
Pos. LUBRIC-02

GILLES
BIOMASS HEATING



LUBRICATION Grate ash removal





Maintenance

Lubrication of bearing on worm screw removing ash from grate

Maintenance

Lubrication of bearing on the ash worm conveyor on multicyclone

Placement

Vis a vis the driving side

Grease substance

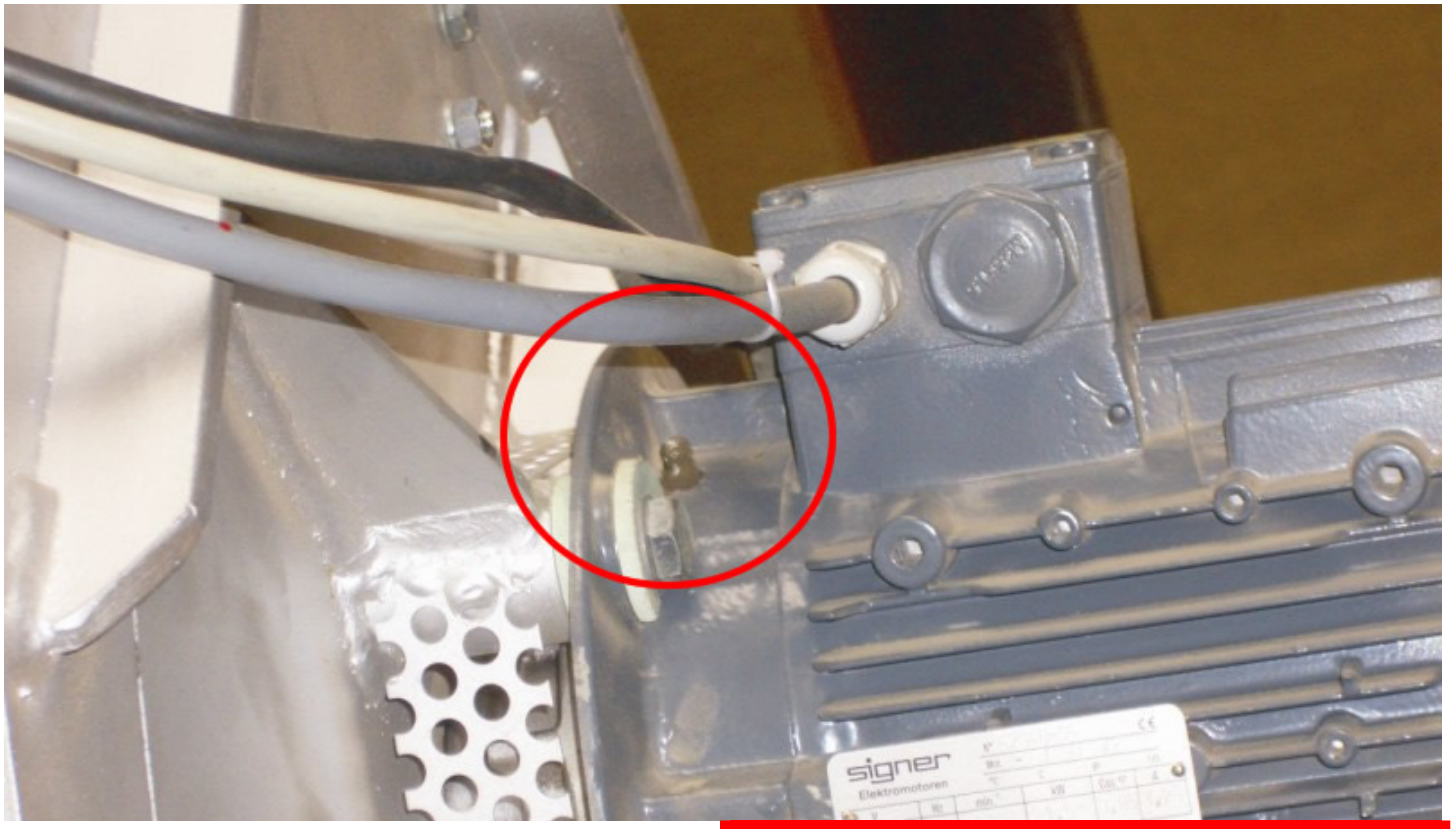
Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

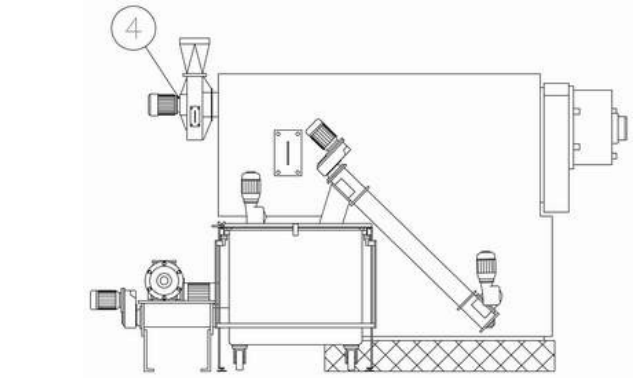
1-2 pump strokes for each greased place

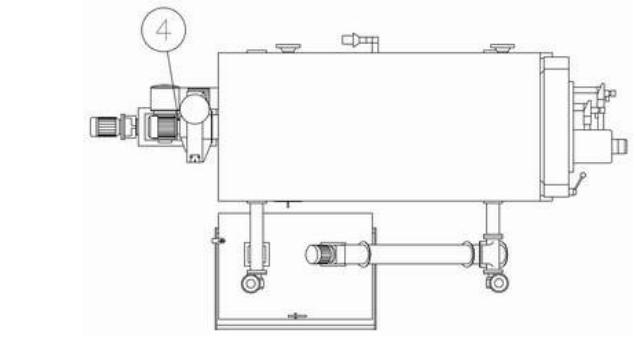
Pos. LUBRIC-03

GILLES
BIOMASS HEATING



LUBRICATION Suction blowers





Maintenance

Lubrication of the bearing between the suction casing and the motor for suction blowers.

Place

On the suction blowers placed on the backside of boiler

Grease substance
Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

1-2 pump strokes for each greased place

Maintenance period

Quarterly

Pos. LUBRIC-04

GILLES
BIOMASS HEATING

CLEANING
Cleaning of heat exchanger

Maitenance

Cleaning of heat exchanger

Placement

Front side od heat exchanger

Procedure

Remvoe the condensed water by pressure vessel of heat exchanger
Maitenance period
Half a year

Pos. CLEANING-01

GILLES
BIOMASS HEATING

CLEANING Compressor

Maintenance

Compressor

Placement

In the heating room near the switch box

Procedure

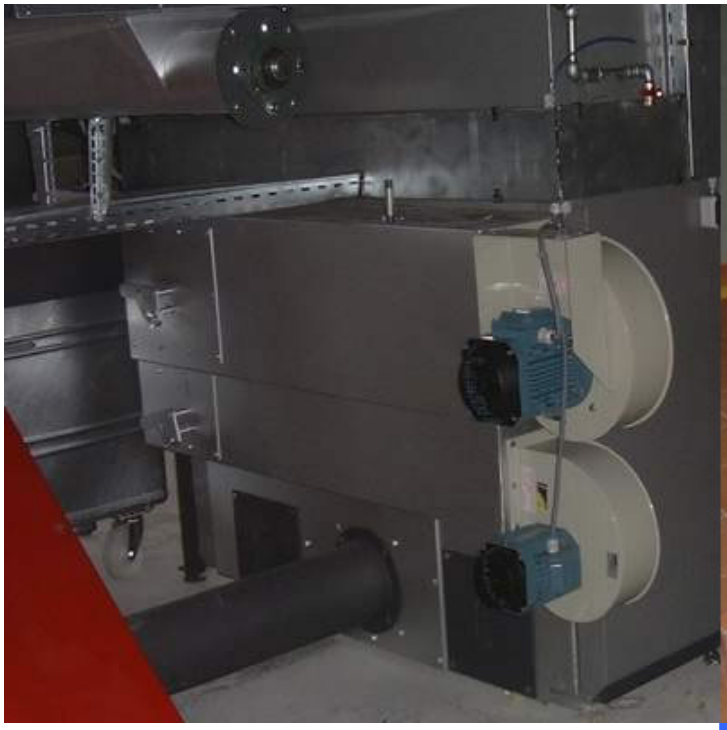
Empty the condensed water vessel on the compressor

Maitenance period

Half a year

Pos. CLEANING-02

GILLES
BIOMASS HEATING



CLEANING

Maintenance

Cleaning

Place

Heating room

Procedure

Cleaning of all motors and blowers

Maintenance period

Half a year

Pos. CLEANING-03

GILLES
BIOMASS HEATING

CLEANING Underpressure tube

Maintenance
Cleaning of the underpressure tube

Placement

Underpressure switch

Procedure

Pull the hose from the underpressure switch connector and clean it by suction – WARNING – do not blow through it – you could damage the undepressure switch connector,

Or

pull out the hose from the underpressure switch connector and measuring unit in switch box and flush the hose.

Maintenance period

Half a year

Pos. CLEANING -04

GILLES
BIOMASS HEATING

CLEANING Hydraulic aggregate

Maintenance

Hydraulic aggregate

Placement
In the heating room near the heating boiler

Procedure

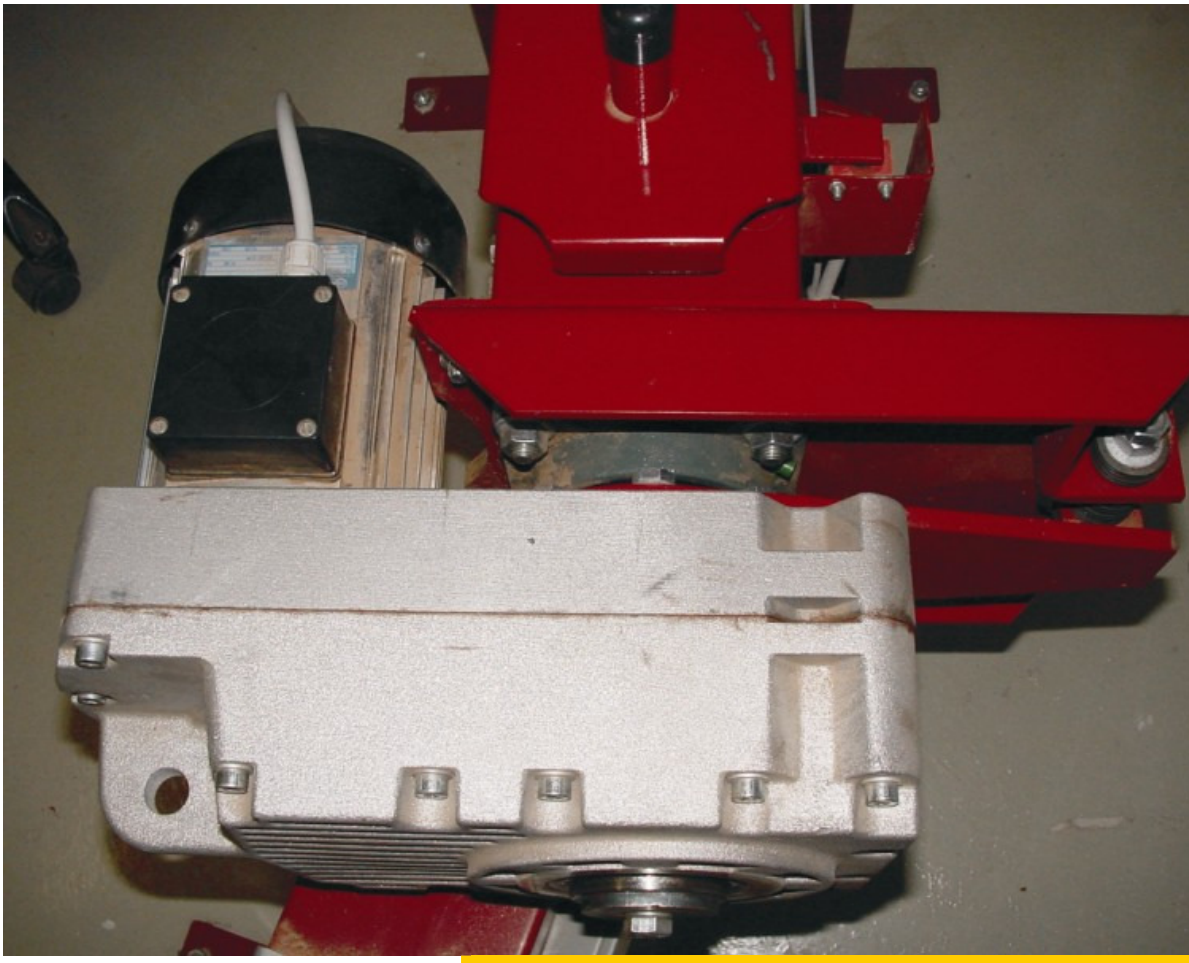
8. Check up the oil level
9. Check up the equipment pressure
10. Check up the operational temperature
11. Check up the sealing of cylinder and hoses

Maintenance period

Once a month

Pos. CLEANING-05

GILLES
BIOMASS HEATING



LUBRICATION Elbow discharge

Maitenance

Lubrication of the flange bearings of elbow discharging worm screw

Placement

Behind the gear motor

Grease substance

Roller bearings grease K2K-20-DIN 51502
Drop point 160°C/132°F at least

Amount of grease substance

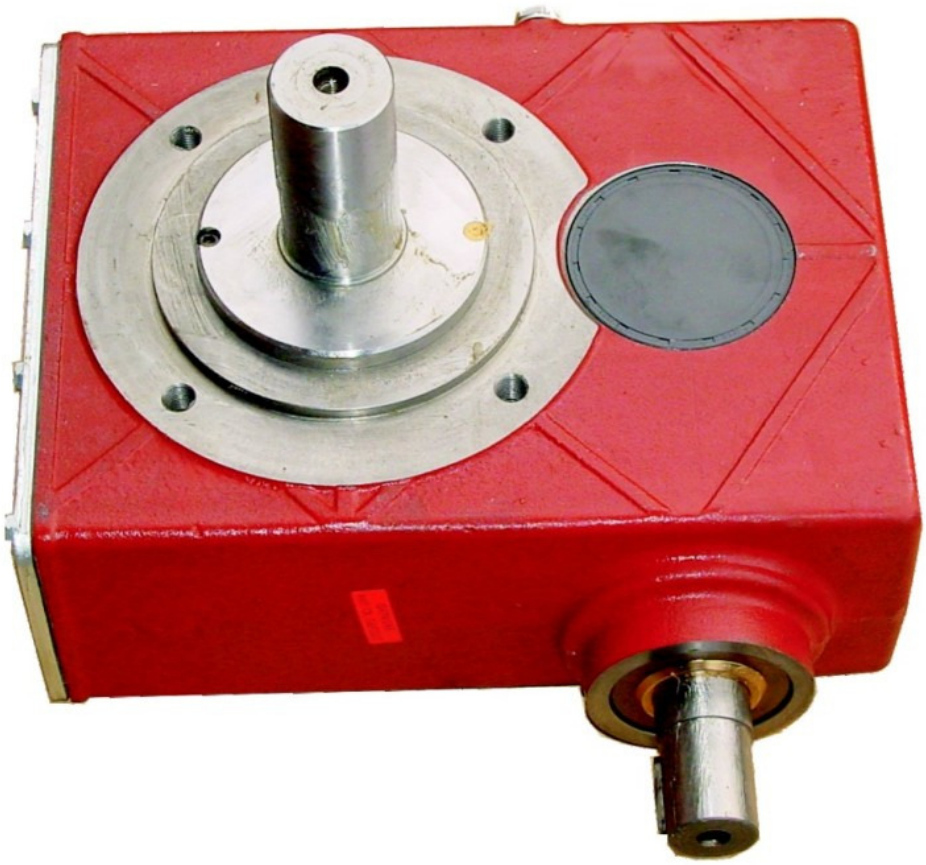
1-2 pump strokes for each greased place

Maintenance period

Quarterly

Pos. ELBOW-01

GILLES
BIOMASS HEATING



LUBRICATION Elbow discharge

Maintenance

Replacement of the gear oil in the elbow discharge system

Emptying of silo is necessary

When working in silo, observe the safety rules for works in silo room

The permission for works is imperatively required

Placement

Beneath the discharge plate in silo room

Grease subsatnce

,Gear oil

Amount of grease substance

See the Operation instruction to gears

Maintenance period

Every 5 years

Pos. ELBOW-02

GILLES
BIOMASS HEATING

Endurance of heating boilers HPK - UTSK				
KW	Δ t	l/h	kvs	Pa
180 KW	10	15.428	48	10.330
	20	7.714		2.580
240 KW	10	20.571	48	18.366
	20	10.285		4.590
300 KW	10	25.714	72	12.755
	20	12.857		3.188
360 KW	10	30.857	72	18.367
	20	15.428		4.591
450 KW	10	38.571	110	12.292
	20	19.285		3.073
550 KW	10	47.142	110	18.366
	20	23.571		4.591
700 KW	10	60.000	182	10.868
	20	30.000		2.717
900 KW	10	77.142	182	17.965
	20	38.571		4.491
1200 KW	10	102.587	283	13.210
	20	51.293		3.302
1600 KW	10	137.142	363	14.273
	20	68.571		3.568
2000 KW	10	171.428	485	12.493
	20	85.714		3.123

Notices:

Gear motors – Oil replacement, periods, inbuilt parts, filling quantities, venting screws, filling openings, oil condition considering.....

Sensor cleaning

Combustion temperature sensor – take of carefully, wipe, install again carefully ....

Examine fire extinguishers according the rule TRVB 118

Notice on maintenance contract

Notice on protective clothing during cleaning works

Notice on manipulation and disposal of used oil, detergents

Control – battery replacement - required?

GREASE-04
Grease for higher temperatures

Hydraulics
Replacement of hydraulic oil

MAINTENANCE AND LUBRICATIONS PLAN

Maintenance

You have bought Gilles heating facility – that means, you have obtained solid equipment, requiring minimum maintenance. Nevertheless, you should pay attention to the following instructions on maintenance, in order to assure a long operational life of your equipment.

Attention

An imperative requirement: Before starting cleaning and lubricating the equipment, its operation must be stopped and the main current supply switched off and assured against an unintentional or unwitting switching on.
Only trained and authorised skilled personal is competent to carry out maintenance works.
Regular and sound maintenances and operation are the best presuppositions of high efficiency and reliability of the equipment.
Only original spare parts used for replacement assure a due performance of the complete facility and assure a claim for guarantee.
Namely in case of works in silo, there is highly important to observe duly all the operation instructions and safety rules, as the works in silo are considered as „dangerous works", imperatively requiring permission for these works.

Grease lubrication

Places not adequately protected against penetration of water and dirty particles must be greased, because the grease substance functions as sealing substance. In addition, the greases can better damp stroke impacts on bearings.

- The bearings are filled with grease upon the installation, so they are prepared for operation.
- The used grease should be suitable for the temperature range from -30 °C to + 90 °C.
- Use the pressure oiler for greasing.
- The storage temperature may be 50 °C over the room temperature at maximum and must not exceed 90 °C. Check up it once a week at least.

Quality of grease

Roller bearing grease K2K-20-DIN 51502 – drop point 160°C/132°F at least.

Quantity of grease

The conveying parts are equipped with various driving devices and bearings depending on their dimensions and fuel quantities delivered, therefore the specified quantities and stroke specifications are only informative.

Lubricated places

The remarked lubricated places must be lubricated ca. once a month (every 200 operation hours). Use pressure oilers for greasing substances (1 – 2 pump strokes for each lubricated point').

Lubrication greases

Type of lubrication grease: K, G, OG, M

- Data for field of use (for synthetic oil additional letters according to oil type: HC,E,PG,S)

Consistency class NLGI

Lower temperature of field of use

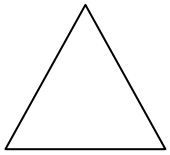
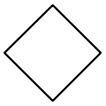
Additional letter marks:

D,E.F,L,M,S,P,V

- Data for usage possibilities

Additional letter marks: C to U

- Data for upper temperature of field of use

1	2	3
Type of grease	Letter marks	Symbol
Greases for roller bearings, sliding bearings and surfaces according DIN 51825	**K**[1)]	For greases on the mineral oil basis 
Greases for closed gears according DIN 51826	**G**	
Greases for open gears, toothings (adhesive greasing materials without bitumen)	**OG**	
Greases for sliding bearings and sealings[2)]	**M**	
Greases on the synthetic basis upon their basic properties are marked as greases on the mineral oil basis.	Insert the marking letter acc. Table 1, substance kind 3	For greases on the synthetic oil basis 
1) In ISO/TR 3498:1986 the letters „XM " are used instead of „K". 2) Minor requirements than on greases of type.		

1	2
Additional letter marks	**Greasing substances**
D	For greasing oils with detergent addition agents e.g. hydraulic oil HLPD
E	For greasing oil used as mixture with water e.g. cooling lubricants that may be mixed with water – e.g. cooling lubricant SE
F	Greasing material added by solid greasing substances (e.g. graphite, molybdenum disulphide), e.g. greasing oil CLPPF
L	For greasing substances containing addition agents increasing the corrosion resistance of material, and/or extending its service life e.g. greasing oil DIN 51217 – CL 100
M	For cooling water mixed lubricants containing mineral oils, e.g. cooling greasing substance SEM
S	For cooling water mixed lubricants on the synthetic basis, e.g. cooling greasing substance SES
P	For greasing substances that contain agents eliminating frictions or abrasions or increasing the endurance resistance of materials, e.g. greasing oil CLP 100
V[1)]	For greasing substances reduced by diluents Greasing oil DIN 51315 – BB-V
Marking letter V shall be added by an abbreviation indicating dangerous materials (in accordance with ordinance on dangerous materials)	

1	2
Consistency mark (NLGI-classes acc. DIN 51813	**Fulling penetration specified according units DIN ISO 2137[1)]**
000	445 to 475
00	400 to 430
0	355 to 385
1	310 to 340
2	265 to 295
3	220 to 250
4	175 to 205
5	130 to 160
6	85 to 115 [2)]
1) 1 unit = 0,1 mm / 2) resting penetration	

1	**2**	**3**
Additional letter marks	Upper temperature used [1)]	Action against water acc. DIN 51807 Part 1: Evaluation steps DIN 51807 [2)]
C	+ 60 °C	0-40 or 1-40
D		2-40 or 3-40
E	+ 80 °C	0-40 or 1-40
F		2-40 or 3-40
G	+ 100 °C	0-90 or 1-90
H		2-90 or 3-90
K	+ 120 °C	0-90 or 1-90
M		2-90 or 3-90
N	+ 140 °C	according agreement
P	+ 160 °C	
R	+ 180 °C	
S	+ 200 °C	
T	+ 220 °C	
U	over + 220 °C	

1) The „upper temperature used" for permanent greasing is identical with the highest testing temperature used for tests according to DIN 51806 Part 2 (at present the Draft) and/or according to DIN 51821, Part 2. if the test procedures are performed:
2) 0 means no change
1 means minor change
2 means mean change
3 means great change

1	2
Additional number marks	**Lower temperature used**
- 10	**- 10**
- 20	**- 20**
- 30	**- 30**
- 40	**- 40**
- 50	**- 50**
- 60	**- 60**

Additional marks for synthetic oils

E	Organic esters
EF	Perfluorine - fluids
HC	Synthetic hydrocarbons
PH	Esters of phosphoric acid
PG	Polyglycol oils
SI	Silicone oils
X	Others

Care

Use a soft, wet cloth for removing impurities from boiler, facings and operational parts. For damping the cloth, use only soft cleaning agents in order to prevent surface scrapping.

Do not use diluents, alcohol or cleaning spirit in any case.

Operation and maitenance logbook

Date	Time	Operation hours		Output	Course	Combustion	Flue gas	Cleaning		Silo filling	Remarks	Validation
		<60%	>60%	%	T°C	T°C	T°C	By oneself	Chimney sweeper	(m^3)	In – out operation defect/mainten.	

Maintenace Gilles - Heating facility

Date:

Facility:

Customer:

Only qualified skilled personal may carry out the maintenance works, while observing all the operation instructions and any currently valid rules. The use of this check list, way, scope and periods of maintenance works shall be specified and adapted to the local prevailing conditions.

Pos.	Description	Maintenance period/ Performance				
LUBRICATION - greasing		quarterly	half a year	once a year	Funct.	Carried out
1	Multicyclone ash removing worm screw	☒			☐	☐
2	Ash rising worm screw (in case of an automatic ash removal)	☒			☐	☐
3	Worm screw remove ash from grate (in case of an automatic ash removal)	☒			☐	☐
4	Between suction casing and motor	☒			☐	☐
5	Bearing of star feeder			☒	☐	☐
MAINTENANCE - heating boiler		quarterly	half a year	once a year	Funct.	Carried out
1	Ash container emptying	Bei Bedarf			☐	☐
2	Unscrew and clean the igniter and igniter tube		☒		☐	☐
3	Cleaning of multicyclone	☒			☐	☐
4	Removal ash from grate	☒			☐	☐
5a	Cleaning of the complete combustion chamber UTSK-under feeding	☒			☐	☐
5b	Cleaning of the complete combustion chamber UTSK-front feeding	☒			☐	☐
5c	Cleaning of the complete combustion chamber UTSK-stepping grate	☒			☐	☐
5d	Cleaning of the complete combustion chamber UTSK-compact	☒			☐	☐
6a	Cleaning of the combustion grate UTSK-underfeeding	☒			☐	☐
6b	Cleaning of the combustion surface UTSK-front feeding	☒			☐	☐
6c	Cleaning of the combustion surface UTSK-stepping grate	☒			☐	☐
6d	Cleaning of the combustion grate UTSK-compact	☒			☐	☐
7	Cleaning of the heat exchanger flue gas duct		☒		☐	☐
8	Cleaning of the suction blower	☒			☐	☐
9	Cleaning of the flue gas tube	☒			☐	☐
CLEANING		quarterly	half a year	once a year	Funct.	Carried out
1	Emptying of condensed water when heat exchanger is cleaned		☒		☐	☐
2	Emptying of condensed water vessel on compressor		☒		☐	☐
3	Cleaning of all the motors and blowers		☒		☐	☐
4	Cleaning of the underpressure pipes		☒		☐	☐
5	Maintenance of hydraulic aggregate			☒	☐	☐
WORM SCREW - maintenance of worm screw conveyors		quarterly	half a year	once a year	Funct.	Carried out
20	Lubrication of worm screw bearing (on the motor side)	☒			☐	☐

21	Lubrication of the worm screw bearing	☒			☐	☐
ELBOW DISCHARGE - maintenance		quarterly	half a year	once a year	Funct.	Carried out
1	Lubrication of elbow discharge system bearings	☒			☐	☐
2	Replacement of gear oil in angle gear			☒	☐	☐
SILO – maintenance of silo discharge system		quarterly	half a year	once a year	Funct.	Carried out
1	Horizontal discharging – replacement of gear smears			☒	☐	☐
PUSH RODS SYSTEM – maintenance		quarterly	half a year	once a year	Funct.	Carried out
1	Lubrication of the cross feeder worm screw bearing on the side of motor	☒			☐	☐
2	Lubrication of the worm screw bearing	☒			☐	☐
3	Hydraulic aggregate		☒		☐	☐
4	Cylinders and hoses		☒		☐	☐

Maintenance Gilles-heating facility		Date:	
Annexes		Customer:	
Lubricants – greasing			
1	Multicyclone ash removing worm screw		☒
2	Ash rising worm screw (in case of an automatic ash removal)		☒
3	Worm screw remove ash from grate (in case of an automatic ash removal)		☒
4	Between suction casing and motor		☒
5	Bearing of star feeder		☒
MAINTENANCE - heating boiler			
1	Ash container emptying		☒
2	Unscrew and clean the igniter and igniter tube		☒
3	Cleaning of multicyclone		☒
4	Removal ash from grate		☒
5a	Cleaning of the complete combustion chamber UTSK-under feeding		☐
5b	Cleaning of the complete combustion chamber UTSK-front feeding		☐
5c	Cleaning of the complete combustion chamber UTSK-stepping grate		☐
5d	Cleaning of the complete combustion chamber UTSK-compact		☐
6a	Cleaning of the combustion grate UTSK-underfeeding		☐
6b	Cleaning of the combustion surface UTSK-front feeding		☐
6c	Cleaning of the combustion surface UTSK-stepping grate		☐
6d	Cleaning of the combustion grate UTSK-compact		☐
7	Cleaning of the heat exchanger flue gas duct		☒
8	Cleaning of the suction blower		☒
9	Cleaning of the flue gas tube		☒
CLEANING			
1	Emptying of condensed water when heat exchanger is cleaned		☒
2	Emptying of condensed water vessel on compressor		☒
3	Cleaning of all the motors and blowers		☒
4	Cleaning of the underpressure pipes		☒
5	Maintenance of hydraulic aggregate		☒
WORM SCREW – maintenance of worm screw conveyors			
20	Lubrication of worm screw bearing (on the motor side)		☒
21	Lubrication of the worm screw bearing		☒
ELBOW DISCHARGE - maintenance			
1	Lubrication of elbow discharge system bearings		☐
2	Replacement of gear oil in angle gear		☐
SILO – maintenance of silo discharge system			
1	Horizontal discharging – replacement of gear smears		☐
PUSH RODS SYSTEM – maintenance			
1	Lubrication of the cross feeder worm screw bearing on the side of motor		☐
2	Lubrication of the worm screw bearing		☐
3	Hydraulic aggregate		☐
4	Cylinders and hoses		☐